

compact is at least 80 kgf/mm² by a three point bending measurement at a temperature between 20°C and 1000°C.

Please cancel claim 3.

REMARKS

Applicants submit that by the present Amendment and Remarks, this application is placed in clear condition for immediate allowance. At the least, the present Amendment places the application in better condition for appeal. Accordingly, entry of the present Amendment and Remarks, and favorable consideration, are respectfully solicited pursuant to 37 C.F.R. §1.116.

Claims 1, 2 and 4 through 10 are pending in this application. In response to the Office Action dated June 6, 2001, the limitations of claim 3 have been placed into claim 1, and claim 3 cancelled. Clearly, the present Amendment neither raises any new matter issue nor raises any new issue for that matter.

A copy of amended claim 1 appears in the Appendix hereto.

Claims 1 through 8 were rejected under 35 U.S.C. §102 for lack of novelty or, alternatively, under 35 U.S.C. §103 for obviousness predicated upon each of U.S. Patent No. 5,443,605 (Suzuki '605) and JP '09059068 (JP '068).

In the statement of the rejection, the Examiner asserted that the prior art compositions appear to be substantially the same as those claims, thereby constituting a complete description

of the claimed invention or at least rendering the claimed invention obvious. This rejection is traversed.

There is no prima facie case.

As stressed in the responsive Amendment submitted May 14, 2001, the factual determination of lack of novelty requires the identical disclosure in a single reference of each element of a claimed invention such that the identically claimed invention is placed into possession of one having ordinary skill in the art *Helifix Ltd. v. Blok-Lok, Ltd.* 208 F.3d 1339, 54 USPQ2d 1299 (Fed. Cir. 2000); *Electro Medical Systems S.A. v. Cooper Life Sciences, Inc.*, 34 F.3d 1048, 32 USPQ2d 1017 (Fed. Cir. 1994). Moreover, in imposing a rejection under 35 U.S.C. §102, it is incumbent upon the Examiner to specifically point out wherein each feature of a claimed invention is identically disclosed in a single applied reference. *In re Rijckaert*, 9 F.3d 1531, 28 USPQ2d 1955 (Fed. Cir. 1993); *Lindemann Maschinenfabrik GMBH v. American Hoist & Derrick Co.*, 730 F.2d 1452, 221 USPQ 481 (Fed. Cir. 1984). That burden has not been discharged. In addition, there are significant differences between the claimed invention and the applied prior art that scotch the factual determination that any of the applied references identically describes the claimed invention within the meaning of 35 U.S.C. §102. Furthermore, a prima facie basis to deny patentability under 35 U.S.C. §103 has not been established.

The Examiner's case to deny patentability to the claimed invention is predicated upon inherency. In order to invoke the doctrine of inherency, the Examiner must provide a basis in fact and/or cogent technical reasoning upon which to predicate the determinations that the allegedly inherent features **necessarily** flow from the teachings of the applied prior art and would have been recognized by one having ordinary skill in the art. *Finnegan Corp. v. ITC*, 180 F.3d 1354, 51

USPQ2d 1001 (Fed. Cir. 1999); In re Robertson, 169 F.3d 743, 49 USPQ2d 1949 (Fed. Cir. 1999).

Moreover, the doctrine of inherency can not be used to improperly shift the burden to Applicants, thereby denying them procedural due process of law.

The Examiner's case is based upon the erroneous assumption that all sintered boron nitride products having a particular grain size necessarily exhibit properties identical to those specified in the claims. However, the Examiner has **not** provided a basis in fact to support that **assumption**. In this respect, Applicants would again rely to the recent decision by the Honorable Board of Patent Appeals and Interferences in **Ex Parte Schricker, 56 USPQ2d 1723 (BPAI 2000)**. Applicants would refer to the following holding by the Honorable Board which appears at 56 USPQ2d 1725;

However, when an examiner relies on inherency, it is incumbent upon the examiner to point to the "page and line" of the prior art which justifies an inherency theory.

Simply put, the PTO has **not** identified any factual basis upon which to predicate the determinations that any sintered cubic boron nitride which happens to have a certain grain size **necessarily** exhibits the diffraction intensity ratio specified in independent claim 1, the thermal conductivity specified in claim 2, *the transverse rupture strength specified in previous claim 3*, the hardness specified in claim 4, the thermal conductivity specified in claim 5, or the thermal expansion coefficient specified in claim 6. *Ex Parte Schricker, supra*. Significantly, in support of its holding, the Honorable Board relied upon *In re Rijckaert, supra*, which requires the PTO to specifically identify wherein an applied reference discloses each feature of a claimed invention.

Applicants recognize that the Examiner does not have testing facilities. However, that does not relieve the Examiner of the burden of establishing a factual basis upon which to invoke the doctrine of inherency. Moreover, as argued on page 5 of the May 14, 2001 Amendment,

there is an abundance of **evidence** in the specification which undermines the inherency theory. In this respect, it should be apparent from Tables 2 through 6 that various factors impact the properties of the resulting cutting tool, including the starting material and methodology, particularly, the temperature. Thus, not only did the Examiner improperly fail to provide a factual basis upon which to invoke the inherency theory, the Examiner **improperly ignored** relevant objective evidence in the specification which undermines the notion that all sintered boron carbide articles exhibit the properties recited in the claims.

At any rate, in order to expedite prosecution, the transverse rupture strength recited in claim 3 has been incorporated into claim 1. This limitation is significant. Specifically, there is certainly no basis upon which to predicate the determination that the articles of the applied prior art **necessarily** exhibit the transverse rupture strength now recited in independent claim 1. Certainly, such can not be considered inherent particularly in light of the data in the specification demonstrating the affect of variables on the transverse rupture strength.

Suzuki '605

Suzuki '605 discloses a polycrystalline cubic boron nitride (cBN) abrasive with a mean grain size of not more than 1 μm and a method for the production thereof. As a raw material, pyrolytic boron nitride (pBN) is employed. In JP-B-63-394 (JP '394), which is discussed in U.S. Patent No. 5,691,260 (Suzuki '260) at column 2, lines 47 et seq., it is disclosed that when pBN is employed as a raw material, the resulting cBN sintered product is highly orientated in the (111) plane direction and the (220) reflection in the X-ray diffraction intensity is very weak or lacking. Even in the case of the Suzuki '605, pBN is employed as a raw material, so the cBN mass obtained before preparation

of the powder shows an $I_{(220)}/I_{(111)}$ ratio of 0, and the resulting powder is polycrystalline to yield a structure orientated in (111). Accordingly, the cBN polycrystalline body shown in Suzuki '605 has a lower strength than that of the present invention. Certainly, there is no basis upon which to predicate the determination that the product of Suzuki '650 necessarily exhibits transverse rupture strength now recited in claim 1.

Applicants would refer to page 5 of the written description of the specification, wherein references are cited which disclose a method comprising preparing cBN from pyrolytic boron nitride (pBN). However, these cBN sintered compacts are **problematic** in that compressed hBN crystals at an ultra-high pressure tend to remain in the cBN sintered compact and exhibit a strong orientation property (anisotropic property) of cBN crystals, resulting in laminar cracking or stripping. As previously mentioned, JP '394, discloses that when employing pBN as a raw material, the resulting cBN sintered compact is highly oriented in the (111) direction and the (220) reflection in x-ray diffraction intensity is very weak or lacking. In contradistinction to the prior art, the present invention requires a large diffraction intensity ratio evincing an isotropic structure. In this case, disadvantages such as laminar cracks and stripping are avoided. Since Suzuki refers to JP '394 in Suzuki '260, for obtaining cBN using pBN as raw material, the orientation takes place in Suzuki '605 using the same raw material to give a lower strength vis-à-vis that of the present invention. Certainly, any notion of inherency, which requires certainty, is laid to rest.

JP '068

The invention disclosed in JP '068 relate to a method of improving the adhesive strength between cBN crystals and increasing the hardness by introducing carbon. However, when there are impurities such as carbon or carbon compounds in the cBN crystal grains, the phonon scattering in

the crystal grain boundaries is increased, thereby decreasing thermal conductivity. Moreover, carbon is present as a ductile material, such as B₄C and, hence, reduces the strength of the sintered compact. Accordingly, JP '068 does not disclose the properties of the cBN sintered compact, but seeks only to improve hardness and provide a sintered compact with a thermal conductivity and strength lowered by the incorporation of impurities. In the examples, moreover, the estimation of the properties were carried out by cutting only the cemented carbide requiring high hardness. The cemented carbide is normally cut with diamond. As argued above, JP '068 seeks to obtain a high hardness cBN sintered compact. However, in accordance with the present invention, the cBN sintered compact exhibits high thermal conductivity and is suitable for high speed cutting by removing impurities, thereby providing high thermal conductivity and strength.

Based upon the foregoing it should be apparent that there is no basis upon which to invoke the doctrine of inherency i.e., that the particles disclosed by JP '068 necessarily exhibit the transverse rupture strength recited in independent claim 1.

Based upon the foregoing differences, it is apparent that the Examiner did not establish a prima facie basis to deny patentability to the claimed invention under 35 U.S.C. §102. *Minnesota Mining & Manufacturing Co. v. Johnson & Johnson Orthopaedics Inc.*, 976 F.2d 1559, 24 USPQ2d 1321 (Fed. Cir. 1992); *Kloster Speedsteel AB v. Crucible Inc.*, 793 F.2d 1565, 230 USPQ 81 (Fed. Cir. 1986). Moreover, the Examiner did not make any "clear and particular" factual findings as to any specific understanding or specific technological principle which would have realistically impelled one having ordinary skill in the art to modify any of the products disclosed in the applied references to arrive at the claimed invention as judicially required. *Ruiz v. AB Chance Co.*, 234 F3d 654 57 USPQ2d 1161 (Fed. Cir. 2000); *Ecolchem Inc. v. Southern California Edison, Co.* 222

F.3d 973, 56 USPQ2d 1065 (Fed. Cir. 2000); In re Kotzab, 217 F.3d 1365, 55 USPQ 1313 (Fed. Cir. 2000); In re Dembiczak, 175 F.3d 994, 50 USPQ2d 1614 (Fed. Cir. 1999).

Applicants, therefore, submit that the imposed rejection of claims 1 through 8 under 35 U.S.C. §102 for lack of novelty or, alternatively, under 35 U.S.C. §103 for obviousness predicated upon each of Suzuki '605 and JP '068 is not factually or legally viable and, hence, solicit withdrawal thereof.

Claims 9 and 10 were rejected under 35 U.S.C. §103 for obviousness predicated upon Kawasaki in view of Suzuki '260.

In the statement of the rejection, the Examiner concluded that one having ordinary skill in the art would have been motivated to employ the methodology and resulting hexagonal boron nitride particles of Kawasaki et al in producing the cubic boron nitride composite of Suzuki '260. This rejection is traversed.

Applicants submit that the Examiner did not make the requisite "clear and particular" findings upon which to reasonably conclude that one having ordinary skill in the art would have been realistically impelled to employ the hexagonal boron nitride particles disclosed by Kawasaki et al. in forming the products disclosed by Suzuki '260, apart from improperly relying upon generalizations. *Ruiz v. AB Chance Co., supra.; Ecolochem Inc. v. Southern California Edison, supra.; In re Kotzab, supra.; In re Dembiczak, supra.*

As argued in the May 14, 2001 Amendment, in accordance with the present invention, hBN raw material is converted into **hard cBN**, Kawasaki et al. merely disclose the use of hBN particles in forming sintered bodies. It is not apparent **why** one having ordinary skill in the art would have somehow **zeroed** in on the **particular** hBN particles produced by Kawasaki et al. for the purpose of

sintering and then employ them in the methodology Suzuki '260 apart from improper relying upon Applicants' disclosure. *Panduit Corp. v. Dennison Mfg. Co.*, 774 F.2d 1082, 227 USPQ 337 (Fed. Cir. 1985)

It should, therefore, be apparent that a prima facie basis to deny patentability to the invention defined in claims 9 and 10 has not been established. Applicants, therefore, submit that the imposed rejection of claims 9 and 10 under 35 U.S.C. §103 for obviousness predicated upon Kawasaki et al. in view of Suzuki '260 is not factually or legally viable and, hence, solicit withdrawal thereof.

Claims 1 through 10 were rejected on the ground of double patenting of the obviousness type over claims 1 through 27 of U.S. Patent No. 6,071,841 (the '841 Patent).

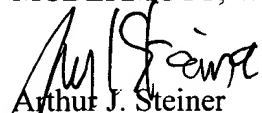
Applicants would consider submitting a Terminal Disclaimer upon an indication of allowable subject matter.

It should, therefore, be apparent that by the present Amendment and Remarks, the rejections of record have been overcome and this application is in condition for allowance. Accordingly, favorable consideration is respectfully solicited.

To the extent necessary, a petition for an extension of time under 37 C.F.R. 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account 500417 and please credit any excess fees to such deposit account.

Respectfully submitted,

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APPENDIX

Claim 1 now reads as follows:

1. (Amended) A cutting tool comprising, as an edge part, a cubic boron nitride sintered compact containing cubic boron nitride having an average grain diameter of at most 1 μm , in which the cubic boron nitride sintered compact has, at the said edge part, an $I_{(220)}/I_{(111)}$ of (220) diffraction intensity ($I_{(220)}$) to (111) diffraction intensity $I_{(111)}$ ratio of at least 0.05 in X-ray diffraction of arbitrary direction and impurities are substantially not contained in the grain boundaries, wherein the transverse rupture strength of the said cubic boron nitride sintered compact is at least 80 kgf/mm^2 by a three point bending measurement at a temperature between 20°C and 1000°C.